

### Abstract

An automatically scrambling nuclear reactor system. One embodiment comprises a core having a coolant inlet end and a coolant outlet end. A cooling system operatively associated with the core provides coolant to the coolant inlet end and removes heated coolant from the coolant outlet end, thus maintaining a pressure differential therebetween during a normal operating condition of the nuclear reactor system. A guide tube is positioned within the core with a first end of the guide tube in fluid communication with the coolant inlet end of the core, and a second end of the guide tube in fluid communication with the coolant outlet end of the core. A control element is positioned within the guide tube and is movable therein between upper and lower positions, and automatically falls under the action of gravity to the lower position when the pressure differential drops below a safe pressure differential.